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AMERICAN JOURNAL of PHARMACY

SINCE 1825

A Record of the Progress of Pharmacy and the Allied Sciences

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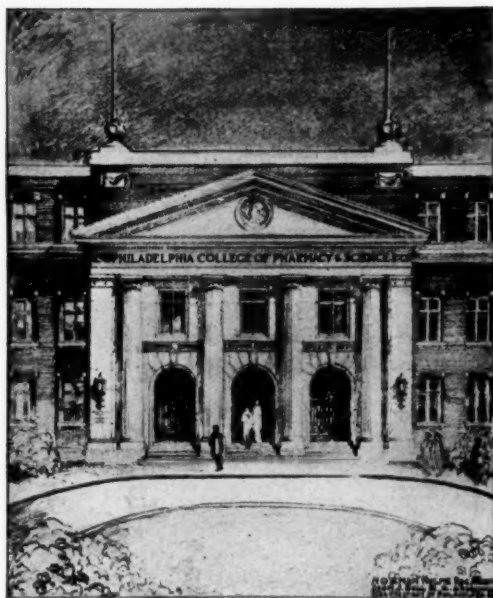
NOVEMBER, 1928

No. 11

EDITORIAL

THE NEW HOME OF THE JOURNAL

DURING ITS LONG EXISTENCE, now well over a century, THE AMERICAN JOURNAL OF PHARMACY has not been handicapped by too frequent a "moving day." And it would not have been



The New Home of the American Journal of Pharmacy.

particularly becoming for such a staid and conservative publication to be continually moving its house and home.

Quite in the natural course of events, however, when the Philadelphia College of Pharmacy and Science moved to its more commodious and elaborate quarters in West Philadelphia, the JOURNAL headed to the same direction.

It need hardly be told what a task it was to gather together the files and archives of a busy century of accu-

mulation—and to have them transported without loss or mix-up to their new quarters.

But this is now all accomplished and the JOURNAL rests comfortably and proudly in a brand new environment.

Naturally, it senses the buoyancy of the occasion and that it is a time for making promises and perhaps for contemplating changes.

Perhaps the most promising statement which can at present be made is that with the beginning of the coming year the scope of the JOURNAL will be amplified and new departments instituted.

One such will be a department where queries pertaining to pharmacy will be stated and answered. Another will review the advances made in the various fields of medicine—particularly as they pertain to pharmacy.

And we have other things in mind to make the JOURNAL yet more readable and serviceable.

On a November evening in the year 1825, Daniel Smith, the first Editor of this journal—in his methodical, meticulous, Quaker way—wrote the following paragraph as the finishing touch to his introductory editorial for the first issue of a new journal.

And the concluding paragraph is always the most difficult of the whole editorial.

But this Quaker gentleman wrote with such quaintness of phrase and modesty of spirit that the Editor, whose privilege it is to write this bit of copy for the JOURNAL, in its new home, borrows his concluding sentiment from the kindly Daniel Smith—

"Should THE AMERICAN JOURNAL OF PHARMACY as maintained by the Philadelphia College of Pharmacy contribute to these results by awakening and fostering a spirit of research and experiment, although laboring in an obscure and humble portion of the vineyard of science, it will reap rewards honourable to its contributors, and useful to the world at large."

At Forty-third Street and Kingessing Avenue, West Philadelphia, where the JOURNAL now lives, these sentiments of its first Editor, Daniel B. Smith, are accepted as reflecting very clearly even in this day the aims and purposes of the periodical.

IVOR GRIFFITH.

ORIGINAL ARTICLES

SUMAC AND POISON IVY*

By Horatio C. Wood, Jr., M. D.

THERE IS AN ANCIENT LEGEND of the deadly Upas tree which exhaled an emanation so poisonous that it was death to sleep beneath its shade; even the birds of the air as they flew over it



Horatio C. Wood, Jr., M. D.

became paralyzed and fell into its branches, there to perish. While the stories of the ancients concerning the toxic powers of this tree are largely fabulous, there is in them this basis of fact, that the Upas tree is one of those plants that can poison by mere contact. A somewhat similar superstition, although not so poetically exaggerated as that of the Upas tree, clings around our common Poison Ivy. This famous—or should I say infamous?—shrub is not at all a relative of the true ivy but belongs to the interesting group of plants known to the

botanists as the genus *Rhus*. Popularly they are called by the ancient Arabic name of Sumac, which in certain sections is corrupted to "Shoemake."

THE SUMACS— TOXIC AND TONIC TOO

The sumacs, as a group, are mostly small trees or shrubs, some of them beautiful, some wicked and some only useful. Most of our native species are irregularly branched with compound leaves, generally lighter green below, and bearing large clusters of yellowish flowers. In the late summer the sumacs are brilliant spectacles along our Pennsylvania hillsides because of their bright scarlet berries borne in large, dense clusters. In the fall the leaves turn to a deep red and afford one of the most colorful bits of the autumn foliage. Although the wood of the sumac is too brittle to be of importance as lumber, in several species it is of a bright lemon-yellow color and beautifully grained; quite frequently it

*One of a Series of Popular Science Lectures given at the Philadelphia College of Pharmacy and Science, 1927-1928 Season.

is used for the manufacture of small articles, especially of the sort that are sold as souvenirs at summer resorts.

In one or two species the berries are pleasantly acidulous and in certain parts of the world are used as food, especially in the form of jellies. Several species are strongly astringent and both the leaves and bark have been used for tanning leather both in Arabia and in America; the fruit of one species is widely used in medicine for its astringency. Several of the sumacs yield coloring matter and are employed as dyes, either red, yellow or black. The most famous of the commercial products from this genus, however, is the resin used by the Chinese and Japanese in the manufacture of their famous lacquerware.

USEFUL SUMACHS

GROUP I. (NON-POISONOUS)

<i>R. coriara</i>	Mediterranean	Tanning and dyeing edible fruit
<i>R. copallina</i>	North America	Red dye
<i>R. glabra</i>	American	Medicine, tanning, dyeing
<i>R. pentaphylla</i>	North Africa	Tanning, edible fruit
<i>R. typhina</i>	American	Tanning
<i>R. semialata</i>	Asia	"Chinese galls," tanning

GROUP II. (POISONOUS)

<i>R. succedanea</i>	Asia	"Cera japonica" for candles
<i>R. vernicifera</i>	Asia	Lacquer
<i>R. toxicodendron</i>	North America	Black dye

Why is it that wickedness is so interesting? Our newspapers spread robbery and murder all over the front page, while art or science feels lucky if it gets a small paragraph in an obscure corner. As with the other things so with the Sumacs; the beautiful or useful we pass by with a word, the wicked is a topic for conversation. Of the seven species found in this country only two are poisonous, but they get five times as much attention as all their sisters combined.

WHERE THE POISON IVY THRIVES

The Poison Ivy, as it is usually called in this locality, known to the botanists as *Rhus Toxicodendron*, is to be found almost everywhere in sections of the United States where plants will grow. I have seen it in open fields and in the side yards of city houses, but it shows a marked preference for fence posts. Its instinct for fences seems almost animal-like. While it rejoices in the partial shade of a side hill or a big

stump, it does not thrive in dense shade. It is a striking phenomenon on a cross-country hike to note the density of the patch of poison ivy which guards the entrance to many a woodlot and the suddenness with which it ceases when one has entered the forest. While it is by preference a vine, climbing up telegraph poles, tree trunks or fence posts, in the lack of such support it is content to grow as a low shrub. Its dense foliage, varying from a vivid green to a bronze tint, and having a lustre almost as if varnished, makes it an attractive addition to many an ugly foreground. As far as I have seen them, the compound leaves



Fig. 1—Poison Ivy on an Old Stump.
(Courtesy of Prof. J. W. Harshberger.)

are always trifoliate, but a five-leaved variety is said to be found in California. This threefold character of the leaf is the most ready distinction from the innocent Virginia Creeper (which has five leaflets) that, in habits and location of growth has tastes very similar. The trifoliate leaf also serves to distinguish it from the true Ivy, which, however, is not so commonly found on wooden fences, seeming to prefer to climb on stone. Some persons find the varnish-like appearance of the leaf of the Poison Ivy to be the most ready distinction. The thing that my own eye notes the quickest is the extraordinary irregularity in the shape of the leaflets. Characteristically they are somewhat heart-shaped with smooth margins, but one will nearly al-

ways find some of them more or less toothed or lobed, often on one side like the thumb of a mitten.

The single native arboreal species of sumac which is poisonous is known as Poison Sumac or Swamp Sumac. It is fortunately much less common than the other members of the genus as it requires considerable skill to recognize readily. It is found nearly always in marshy places or along the banks of streams; the harmless species which it most closely resembles prefer dry, open fields. Like all of the sumacs, its leaves turn a brilliant scarlet in the fall and make a tempting lure. The leaves are not easily distinguished from the upland and smooth sumacs, the most certain feature being the entire margins. The poisonous species of sumac—both the arboreal and the

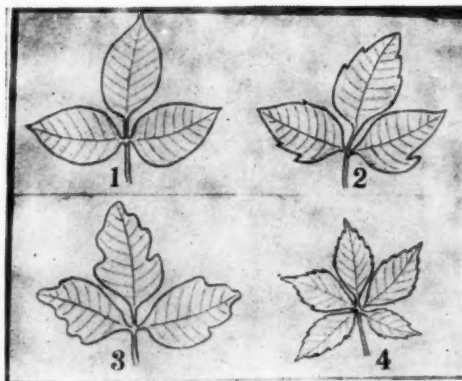


Fig. II—1, 2 and 3: Different Forms of Poison Ivy Leaves.
4: Leaf of Virginia Creeper.

vineal—can be definitely recognized by the fact that the flowers and fruit are axillary, that is, borne in the fork of the leaf with the stem, whereas in the harmless they are terminal, at the end of the branches. They may also be distinguished by the character of the fruit; in the innocent sumacs the berries are in rather dense clusters and of a bright red color (whence the generic name of *Rhus*), while in the poisonous there is a sparse cluster of dirty greenish-white berries about an inch in diameter.

**FACTS AND
FANCIES OF
IVY POISONING**

Many persons think they know something about ivy poisoning, but a remarkable thing is that despite a considerable amount of scientific study we have no definite knowledge of the nature of the poison, of its mode of con-

veyance nor of the best treatment. The popular belief is widespread that the poison is volatile and capable of being carried by the wind. To question this belief is almost like doubting the evidence of our senses; many are the persons who have been severely poisoned and are confident that they have not touched the plant. Yet all the scientific investigations which have been made seem to negative this idea. McNair glued a leaf of poison ivy on the inside of a watch crystal and fastened this crystal to the arm of a person, known to be susceptible, in such a way that the leaf while within a fraction of an inch of the skin did not come in direct contact with it. It was left there for



Fig. III—Staghorn Sumac. Note the Berry-Clusters at End of the Branches.

several hours but no irritation occurred. In another series of experiments Rost and Gilg blew a current of air by an electric fan through a bunch of foliage directly on the bare skin of a susceptible person for a long time without any ill effects. Youngken, who finds it hard, as I do, to deny all the stories of wind-borne infection, suggests that the hairs of the leaf, which he believes may contain some of the toxic substance, might be broken off and carried by the wind. But there is no convincing evidence that the poison is found in these hairs and the experiments of Rost and Gilg seem to throw doubt on this theory. A much more probable explanation is found in the extraor-

dinary toxicity and the ease with which it may be passed from one body to another. For example: A friend has been plucking leaves, you shake hands with him, some of the offending material may come off on your fingers which are later carried to the delicate skin of the face, which becomes inflamed. You are walking along the countryside and, knowingly or unwittingly, step on some poison ivy; when you remove your shoes at night the poison can attach itself to your hand and be carried to various parts of the body. Croquet balls, garden implements, etc. have been shown to be responsible for the conveyance of the infection.



Fig. IV—Poison Ivy Leaves and Fruit.

Various chemists have claimed to have separated the poison in a more or less pure state, but the present evidence is not sufficient to permit of positive decision between the conflicting claims. The two most widely respected are those of Pfaff, who believes it to be an irritant fixed oil—for which he suggests the name of Toxicodendrol—and of McNair, who found a non-volatile phenolic resin which he called Lobinol. An interesting observation of McNair's is that there is also present an oxidase which in the presence of the air gradually detoxicates the poison.

It is scarcely worth while to descant at length on the symptomatology of ivy poisoning, those who have it are likely to know it and

those who do not are not much interested. There are, however, a few features of it which should be emphasized. The first of these is its distinct and marked contagiousness. Not only may it be spread from one person to another but also from one part of the body to another. A person who has handled some of the plant is likely to have the inflammation develop on the face—even without occurring on the hands—because we are continually carrying our hands to our faces and the thinner skin of the face is much more susceptible. Generally speaking the irritation is more likely to occur and to be more severe on those parts of the body where the skin is thinner. For this reason the favorite seat on the hands is the area between the fingers, and the inner surface of the forearm is much more likely to be affected than the outer; in the face it is especially prone to be found around the eyes.

Another striking phenomenon is the variation in susceptibility between different persons and apparently of the same person at different times. Just how many people are susceptible is impossible to say, but my own feeling is strong that it is close to 100 per cent. of the population. In other words, I gravely doubt whether there is such a thing as complete immunity to it, although there is certainly a wide difference in the ease with which people get it.

FAVORITE REMEDIES

As regards the treatment of ivy poisoning I am sorry to say that I can not tell you any certain way to stop it. May I request, however, that if you know of any "sure cure" please do not tell me about it. You may be reasonably certain that your favorite remedy has been thoroughly tried and while it may have succeeded in your attack will fail in someone else. McNair in his monograph on the subject, lists nearly 100 remedies which have been recommended, many of them as certain specifics. Some of these are doubtless more or less useful; they may relieve the itching or shorten its duration, but none of them can be guaranteed to cure.

We may divide the remedies for ivy poison into two groups: those which simply aim to relieve the itching and burning and those which are employed with the idea of hastening the recovery. Of the symptom remedies I am inclined to believe that phenol is probably the most efficacious, but a strong solution of epsom salts has its proponents, and soaking in hot water will often assuage the uncomfortable sensations.

The drugs which have been suggested for curatives are in two groups: those which aim to remove the poison and those which are supposed to destroy it chemically. Among the former, the most important are soap and alcohol. These are both undoubtedly useful, especially to prevent infection after exposure. There is one danger that must be borne in mind in applying these remedies, and that is the danger of spreading the irritant either over a larger area or to other parts of the body. The poison seems to be soluble in alcohol and if the latter be allowed to run over the affected surface to healthier areas of the skin, it will carry dissolved poison with it.

Among the remedies that have been suggested as chemical neutralizers, the most important are the salts of the heavy metals such as zinc, lead or iron, and various forms of sulphur. There is very strong evidence that the poison may unite with the heavy metals to form compounds which are insoluble and probably non-irritating. While lead acetate and zinc oxide both have their proponents, I am inclined to the opinion that ferric chloride is the best of this group. Of the sulphur compounds the sodium thiosulphate, the common "hypo" of the photographer, is the most used, but McNair has found the sodium sulphite more efficient.

**"LIKE CURES
LIKE"**

Solomon is reputed to have been the author of the saying that "there is nothing new under the sun," and it is interesting to know that one of the most recent methods of treatment has been a tradition of the populace for hundreds of years. That is, the idea of developing a resistance to the poison. It is even asserted that the American Indian had evolved the idea of chewing the leaf to lessen susceptibility even before the advent of the "paleface" on this continent.

The modern craze for provoking immunity may be dated to the communications of Strickler, 1918, and Schamberg in 1919. The theory which is back of this method is very similar to that of the vaccines and similar bacterial products, namely, that from the introduction of small doses of the poison into the general system, the body acquires the power of neutralizing the poison and thus curing the local lesion. Schamberg, in his original paper, used the homœopathic tincture of *Rhus tox.*, but in recent years various manufacturers have put out special preparations which are intended especially for hypodermic use. While there is a considerable body of clinical reports which seem to suggest that this method of treatment may have some efficacy—both as curative and as preventive—it is worthy of note

that the only attempts, as far as I know, that have been made to measure scientifically the immunity conferred have failed to show any considerable degree of resistance. While one should not speak too dogmatically in view of the paucity of evidence, I confess that personally I have not been greatly impressed with the arguments of the advocates for this practice. It is interesting from the standpoint of abstract science to note that up until now, only substances belonging to the group of proteins have been demonstrated to provoke the so-called immunity reactions in the body and there is no reason to believe that the toxic principle of this plant is a protein.

The following method of treating ivy poisoning probably holds forth as much likelihood of being useful, in the majority of cases as any. The part should be thoroughly washed with soap and water using a soft brush, such as a shaving brush, to work up a good lather. Care must be observed not to spread this lather to adjacent parts of the body because by so doing the poison may be carried with it. Some recommend washing the part with alcohol, but while this is efficacious there is much danger of spreading the poison. After washing, the part should be carefully dried with a soft piece of muslin or cotton, and then painted with a 5 per cent. solution of chloride of iron. The ordinary tincture of iron chloride diluted with two parts of water is about the right strength. This should be allowed to dry on the skin. If despite these precautions the skin becomes inflamed, a dilute solution of carbolic acid, about 2 per cent., is useful to relieve the itching and burning. The parts affected should not be exposed to sunlight and should be protected from the air as far as possible. McNair recommends strongly the covering of the affected parts with surgical paraffin to exclude the air. It is probable that the beneficent action of such resinous drugs as *Grindelia* is to be attributed to their protective properties. If blisters should form they should be punctured aseptically. It is very important to avoid scratching or breaking the blisters as either of these is likely to allow the entrance of bacteria into a skin whose resistance has been reduced and give rise to a new disease which may be more troublesome than the ivy poisoning.

LACQUERWARE The most interesting of the commercial products from the sumacs is the lacquerware. Genuine lacquerware is *sui generis*; it differs from everything else in the world. While it is often imitated, no other substance possesses all its valuable properties. We constantly coat metal or wood with a layer of resin-

ous material, for the purpose of beautifying it or protecting it against the elements, but the art of lacquering has little in common with the process of varnishing, either in purpose, method or product. When we varnish a chair, or a door, or a table, we regard the piece of furniture as a piece of wood, the varnish is simply an external finish. Lacquerware is often built up on a background of thin wood, but the wood serves merely as a skeleton, the object is really made of lacquer. The art of lacquering appears to have originated, like so many of our useful or beautiful inventions, in the ancient kingdom of China, but has reached its highest development in Japan. The first evidence of a knowledge among the Japanese of the art dates to the latter part of the fourth century after their invasion of Korea, but it did not become of great importance till several centuries later. It reached its

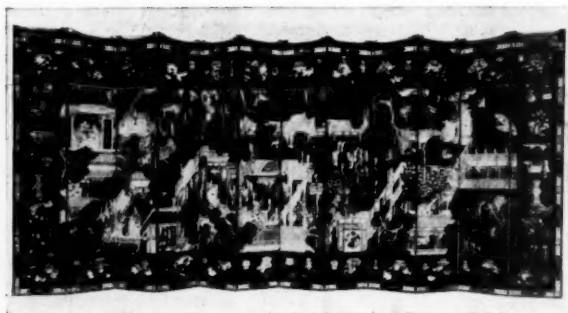


Fig. V.—Chinese Lacquerware Screen in the Museum of the University of Pennsylvania.

acme some time about the sixteenth century and after that entered into a period of more or less decline, but in recent years there has been an evident renaissance.

While modern chemistry has greatly improved the protective materials which are applied to wood under the name of varnish—and some manufacturers have even claimed that their product will withstand boiling water—I know of none that will resist so many deleterious influences as does Sumac lacquer. Not only will it withstand the temperature of boiling water—and I may remark in passing that lacquer vessels are habitually used for soup bowls in Japan—but also hot alcoholic liquors, most acids, and even caustic alkalies. In 1878 a ship carrying the Japanese exhibit at the International Exhibit in Vienna sank in the Red Sea. When salvaged a year later the ancient lacquer pieces, brought to the surface and cleaned, still retained

their original beauty and appeared in no way to have been affected by a year's submergence in salt water.

The permanence of lacquerware is partly due to the peculiar method of manufacturing, but probably in greater part to the chemical properties of the Sumac resin. Its manufacture has never been extensively practiced in either Europe or America and probably never will. The Caucasian race lacks the patient persistence of the Mongolian, which is essential for the successful practice of this art. The whole process, from the collection of the sap to the final decoration with the artist's brush is one which requires tedious and skillful manual labor.

While it is probable that several species of the Genus *Rhus* contain in their sap more or less of the extraordinary resin, commercially it is derived almost entirely from the *Rhus Vernix*. This is a small tree rarely exceeding a height of thirty feet and closely related to our native poison sumac, and like it producing a resin which causes inflammations of the skin to those who touch it. Practically all those who are engaged in the lacquerware industry suffer at first from intense irritation of the skin, often associated with serious constitutional symptoms; after a while, however, they appear to develop an immunity. The resin, which is known in Japan by the name of *Urushi*, is largely produced in one or two northern provinces where the tree is extensively cultivated; in China it is limited largely to the province of Foo Chow.

The collection of the sap requires a considerable degree of dexterity and experience. The collector walks through a grove of trees armed with a sharp knife and a sort of spoon-like scraper. With the knife, after the removal of the external bark of the tree, he makes a series of transverse gashes through the bark and cambium layer, each cut being made with a single stroke of the knife, not deep enough to seriously injure the wood but so placed as to tap the largest possible number of resin canals. After so incising ten or fifteen trees he returns to the beginning of the group and with his spoon scrapes out from each cut the few drops of sap which have exuded. The sparsity of the yield and the consequent labor involved in collection may be gauged by the fact that a single tree bled to its death will rarely yield as much as two ounces of lac.

The juice as it first exudes is a grayish, milky liquid which, on exposure to air, rapidly becomes brownish and eventually almost black. It contains a gum closely related to, if not identical with, the

arabin of Acacia, and a resin. The chief constituent of the latter is a resinous acid sometimes called "Lac-acid" but more frequently Urushic acid from the Japanese name. In the fresh state the resin does not differ materially in its physical properties from other vegetable exudates, but there is present also in the sap an enzyme which, in the presence of air, brings about an oxidation of the Urushic acid into a compound not affected by caustic alkalies or by most of the usual solvents for resin.

The methods of treating the crude sap to prepare it for use in the lacquer art differ according to the specific purpose for which it is to be employed. Some thirty or forty different kinds of lacquer are recognized in the trade, each one fitted for some peculiar part which none of the others can play. In general the lacquers may be divided into two chief types, the transparent and the opaque. The latter have been mixed with various pigments, cinnabar for red, iron or charcoal for black, indigo for blue, and often powdered gold or other metals.

In the manufacture of lacquerware the artisan first makes a skeleton of the object—be it a box, bowl, fan or screen—out of thin board or paper mache. The next step, which is called "luting," is the application of a sort of filler made up of a mixture of lac and rice paste to fill up the cracks and knots and grain. After this is dry a sizing coat of lac is then applied and on this is fastened, with a special adhesive of lac and paste, a thin piece of muslin or similar textile. Over this is applied some seven or eight layers of different mixtures of lac, each coat being allowed to thoroughly harden and rubbed smooth before the next is applied. After one or two weeks of almost continuous labor, the article is ready for the market or may be turned over to an artist for decoration.

The decoration of lacquerware is not an industry but it is a fine art ranking with painting and sculpturing in its possibilities, yet differing from both. Some of the most famous artists that Japan has ever produced have not thought it beneath their dignity to work with the lacquer medium. Many thousands of dollars are not infrequently paid for a single lacquer picture.

We must not forget, however, that in Japan lacquerware is not merely the plaything of the rich, but has an important utilitarian rôle in the life of the poor. Cups and bowls, as well as fans and boxes, and a large variety of other objects, useful as well as ornamental, are made from it. To a large extent it takes the place of both metal and glassware in the domestic economy of the Japanese.

BIOCHEMICAL STUDIES OF THE NORTH AMERICAN SARRACENIACEÆ. THE USE OF THE GENUS SARRACENIA IN MEDICINE: A REVIEW

By Joseph Samuel Hepburn, A. M., B. S. in Chem., M. S., Ph. D.,
Associate Professor of Chemistry in The Hahnemann Medical College
and Hospital of Philadelphia.

A SERIES of researches on the biochemistry of the *Sarraceniaceæ* or American pitcher plants (1) has included a survey of the literature. Several species of the genus *Sarracenia* of this family have been used as therapeutic agents, chiefly in the treatment of gastrointestinal diseases and of smallpox, although they have also been used in other diseases. One species, *Sarracenia purpurea*, is included in the homoeopathic pharmacopœia and in the eclectic dispensatory. *Sarracenia* is also mentioned in the United States Dispensatory (39). It has seemed desirable to collect the widely scattered literature on the use of these plants in medicine, and to present a summary of it in the form of a review.

Use in Gastroenterology. Porcher (2) describes the use of the rhizomes of *Sarracenia variolaris* (*S. minor*) and *S. flava* as a remedy for indigestion and dyspepsia. The rhizome, he states, "is usually given in substance, a small portion being chewed and swallowed before and after each meal. The tincture, made by pouring a pint of brandy over several ounces of the root is applicable where the stimulating effect of the alcohol is not contraindicated." The rhizomes exerted a diuretic action on some patients.

The rhizome was ingested by a healthy individual (Porcher), as much as 180 grains being taken during a period of 2 hours. It was found to possess tonic properties, stimulated the stomach, increased the appetite inordinately, produced an increase in the pulse rate, acted as a diuretic, and, secondarily, as a mild cathartic. It produced a feeling of congestion about the head, of fullness about the occiput.

Palmer (3) used a tincture of the rhizome of *Sarracenia flava* with gratifying results in the treatment of diarrhoea. The tincture was prepared by macerating 4 ounces of the rhizomes in 2 pints of diluted alcohol for 14 days, then filtering. The dose was 1 teaspoonful of the tincture after each evacuation.

Mellichamp (4) mentions the use, in the south, of the rhizomes of *Sarracenia variolaris* (*S. minor*) and *S. flava* "in the treatment of dyspepsia, gastralgia, pyrosis, etc.", and states that they probably possess "biter-tonic and stomachic properties."

Roe (5) administered the fluid extract of *Sarracenia flava* with prompt success in the treatment of diarrhoea in both adults and infants (summer complaint). The dose for an adult with either chronic or acute diarrhoea was 15 drops of the fluid extract given in water after each evacuation of the intestines.

Rusby (6) cites a personal communication to him from E. W. Lane concerning native southern remedies including, among other plants, *Sarracenia variolaris* (*S. minor*) and *Sarracenia flava*. The communication was accompanied by fine pressed specimens of all parts of the plants. The two species of *Sarracenia* were described by Lane as tonic and slightly anodyne and of use in dysenteries. Rusby considered these medicinal properties to accord well with the physiological habits of the plants: "A secreted substance capable of intoxicating insects would be likely to give it 'slightly anodyne properties,' and its digestive principle would be likely to render it tonic. As to its use in dysenteries, its abundant astringency would render it serviceable in diarrhoeas which often assume a dysenteric type, but scarcely in a real dysentery."

Use in Smallpox. Miles (7) described the use of the rhizome of *Sarracenia purpurea* by the Micmac Indians as a remedy for smallpox. One ounce of the powdered rhizomes was mixed with 1.5 pints of spring water in a covered pot; and the mixture was permitted to simmer slowly for 4 or more hours until the volume of the liquid was reduced to 1 pint. The liquid was then strained. The full dose of this decoction was a full wineglass or 1 gill; this dose was given once or twice daily, and not more than 4 doses were required as a rule, in the treatment of a case of smallpox. At times the dose was given every 4 or 6 hours.

When an individual was suspected to be attacked by variola, but showed no distinct pock marks, a full dose of the decoction was given him. The eruption was at once brought out. After a second or third dose, with a period of 4 or 6 hours between doses, the pustules subsided. The patient felt better after each dose.

When the patient was already covered with pock marks in an early stage, a dose or two of the decoction dissipated the spots, sub-

duced the febrile symptoms, and made the patient feel an improvement in his condition. "The urine, from being scanty and high colored, becomes pale and abundant." In 3 or 4 days the prominent symptoms of constitutional disturbance subsided, though the patient was treated as an invalid until the ninth day. No marks of the eruption, such as pitting, were present on Indians who had been treated with this remedy while suffering from smallpox. In fact no fatal cases of smallpox occurred among Indians who were moderately healthy when attacked by that disease, and were given this remedy during the first week of the attack.

For prophylaxis, a dose of a weak infusion of the rhizomes was taken occasionally through the day, in order to "keep the antidote in the blood" when exposed to infection.

In a further communication Miles (8) stated that the Indians consider the rhizomes alone to be efficacious in smallpox, and consider the leaves to be worthless in the treatment of that disease. The fresh rhizomes are not considered as potent as rhizomes prepared as follows: "The root, when freshly gathered, should be at once slowly and thoroughly dried, the thin fibres around it pared away, and the firm solid root alone used."

Miles enumerated the results obtained on administration of the decoction to a patient already covered with the eruption of smallpox: (1) A rapid diuretic action, immediate lessening of the febrile symptoms, and, more tardily, an action as an evacuant on the large intestine. (2) When the patient showed any symptoms of cerebral disturbance, a mitigation and obvious improvement occurred on repeated administration of the decoction, doses being given at intervals of 3 or 4 hours. (3) The character of the eruption was altered in a brief period; the pustules dessicated and fell away. (4) Pitting was prevented.

Miles reported the successful use of this remedy in a case of smallpox in a young white man.

Morris (9) also reported the use of a decoction of the rhizome of *Sarracenia purpurea* by Micmac Indians as a "remedy for smallpox, in all its forms, in twelve hours after the patient has taken the medicine. . . . However alarming and numerous the eruptions, or confluent and frightful they may be, the peculiar action of the medicine is such that very seldom is a scar left to tell the story of the disease." Morris considered that the remedy acted by actual contact with the virus in the blood, rendering it inert and harmless,

stating: "This I gather from the fact that if either vaccine or variolous matter be washed with the infusion of the *Sarracenia*, they are deprived of their contagious properties."

In the preparation of the remedy, a dessertspoonful of the powdered rhizomes was mixed with 1 pint of water; and the mixture was permitted to simmer until its volume had decreased to one-half pint. The liquid was divided into 2 doses, one taken immediately, the other in 6 hours. Sugar was not to be taken with the medicine. The remedy acted as a diuretic, for the urine became abundant and limpid soon after taking it.

Morris considered *Sarracenia purpurea* "a powerful antidote for all contagious diseases." He states that he used it during an epidemic of smallpox in 1861 and adds "after my trials then and since, I have been convinced of its astonishing efficacy."

The communication of Morris was reprinted in full in several journals (10, 11 and 12).

Miles (13) and his brother (14) on the one hand, and Morris (15) on the other hand, indulged in a controversy concerning priority in announcing the use of *Sarracenia purpurea* as a remedy for smallpox.

In the course of this controversy Morris (15) stated that he had witnessed the undoubted alexipharmic power of the remedy in about 25 cases of smallpox, and mentioned its action "upon congestive ganglionic irritability and all cerebral neuralgic development," as well as its action upon the kidneys. According to Morris, the remedy "extinguished" the variolous poison, then caused an accelerated excretion of the "extinguished" poison through the kidneys. He claimed to have used the decoction of *Sarracenia purpurea* with success in the treatment of psora, lepra, skin diseases, and smallpox; and he pronounced it without hesitation the remedy for these diseases, also for rubeola (measles) and varicella (chicken pox). "Roots, young or old . . . rootlets, rhizoma, radicals, and even the loose floculi of the epidermis that so easily separate from the plant by friction" were directed to be used in the preparation of the decoction, mixing 1 dram of them with 1 pint of water, and then concentrating to a volume of one-half pint. The dose was 1 wineglassful every 3 hours throughout the disease.

In this work on the use of *Sarracenia purpurea* as a remedy for smallpox, Miles had the cooperation of Hardy, and Morris the cooperation of J. T. Lane.

Logie (16) reported that Agnis and himself had used *Sarracenia purpurea* with success in the treatment of 11 cases of smallpox. The development of pustules was arrested; and pitting was prevented. The remedy was prepared by mixing 1 ounce of the sliced rhizomes with 1 quart of water, which was then permitted to simmer down to a volume of 1 pint. The dose of this decoction was 2 tablespoonfuls every 4 hours.

Cigliano (17) obtained successful results in the treatment of smallpox with the homeopathic tincture of *Sarracenia purpurea* and its derivatives, administered in homeopathic dosage. Five cases were reported. In the prodromal stage, both the fever and the disease were broken. In the stage of eruption, the body temperature was usually reduced in a few hours, and then remained between 37° and 39° C.; the suppurative fever was prevented; and the pulse rate was lowered. The variolous papulae became vesicular, but never developed into perfect pustules; they dried up; and pitting was prevented.

He also used this remedy for prophylaxis to protect from attack persons who were exposed to infection by smallpox; they either escaped infection or suffered only a very mild attack of the disease.

Mouremans (18) used homeopathic preparations of the tincture of the fresh plant of *Sarracenia purpurea* for over a decade both in the treatment of smallpox and as a prophylactic against attacks of that disease. His results were gratifying. As a prophylactic, 8 globules of the third dilution were taken on retiring for 10 successive days. In the treatment of smallpox, 12 globules of the third dilution were dissolved in 8 spoonfuls of water, and 1 spoonful of the resulting solution was administered every 1 or 2 hours. During a single epidemic, Mouremans used this remedy in the treatment of over 200 smallpox patients, and administered it as a prophylactic measure to over 2000 persons. All of his patients recovered; and none of those who received the prophylactic treatment were attacked by the smallpox.

Sarracenia variolaris (*S. minor*) has been used as a specific for small pox (6).

A Committee on *Sarracenia purpurea* of the New York County Medical Society (19) studied the use of an infusion or decoction of the rhizome of that plant as a remedy for smallpox and reached the following conclusions, based on the work of American and English physicians.

"1st. That the analyses already made of the plant do not give any active principle or elements which would indicate any great medicinal potency. 2d. That the discoverers and advocates of the specific remedial power of the *Sarracenia purpurea* over variola have given apparently too great credit to the 'post hoc' circumstances, as being 'propter hoc' influences (one reason for this latter inference being suggested by the loose, unscientific, and eulogistic style of the communications). And 3d. That the reliable recorded experience thus far, appears to preponderate against the remedial efficiency of this plant in those forms of the disease which do not generally recover under the administration of ordinary remedies."

An unsigned editorial note in the *Medical and Surgical Reporter* for the year 1862 (33) states that: "at a recent meeting of the Medical Society of Nova Scotia, held at Halifax, the subject was discussed, and a resolution passed to the effect that there was not 'any reliable data upon which to ground any opinion in favor of its value as a remedial agent.'" The "subject" of the discussion was the use of the Indian remedy, *Sarracenia purpurea*, in cases of smallpox.

Lambert (20) mentions the use of the pitched leaves and the rhizomes of *Sarracenia purpurea* simultaneously in the treatment of smallpox. He states that beneficial results were practically nil.

Smith (37) described *Sarracenia purpurea* as a sedative in eruptive disease, and attributed to it an additional influence in smallpox not possessed by any other remedy. He reported the successful use of *Sarracenia purpurea* in five cases of confluent smallpox.

Use in Other Diseases. Roe (21) used preparations of *Sarracenia flava* with successful results in the treatment of certain inflammatory conditions of the mucous membranes.

A concentrated solution, containing the active principles, was obtained by exhaustion of 1 pound of rhizomes with the "strongest" alcohol, addition to this tincture of one-third pound of glycerol and sufficient water to produce a final volume of 1 pint, removal of the alcohol by evaporation, and filtration. This preparation was diluted with 3 times its volume of water, and was used for local application in gonorrhoea.

Roe found an extract of *Sarracenia flava* (1 part) in glycerol (2 parts) of value in the local treatment of leucorrhoea. He also used this plant in the treatment of post-nasal catarrh and of ozoena.

Lambert (20) mentions the use of *Sarracenia purpurea* as a sovereign remedy for gouty diathesis. The infusion of the pitched leaf and the residue from the infusion were ingested at the same time. The dose was 1 to 2 teaspoonfuls of the powdered leaves, taken both night and morning during the attack, in the evening only under normal conditions.

Lambert also mentions the use of *Sarracenia purpurea* as a diuretic, as a remedy in dyspepsia, and as a tonic excellent for maladies of the intestines, kidneys, and liver. He naively adds: "We hand over this information for experiment and medical verification."

Use in Homeopathy. The Homoeopathic Pharmacopoeia of the United States (22), which is published under the direction of, and copyrighted by the Committee on Pharmacopoeia of the American Institute of Homoeopathy, describes a tincture of *Sarracenia purpurea* with a drug strength of one-tenth. The parts used are "the fresh plant, including the root." The moist magma of the plant tissues is extracted with a definite mixture of strong (94.9 per cent. by volume) alcohol and water, so that 1 liter of the tincture contains the active principles present in 100 grams of the solid matter of the plant. Directions are also given for the preparation from this mother tincture of second and third decimal (2X and 3X) and higher dilutions, and third decimal and higher medications.

The American Homoeopathic Pharmacopoeia (23) describes a tincture of *Sarracenia purpurea* with a drug power of one-sixth, prepared from the "fresh plant, gathered when coming into flower."

Provings or studies of the pharmacodynamic action of *Sarracenia purpurea* in homeopathic doses have been made by Bute (24), Cigliano (17), Oehme (25) and Macfarlan (26). The symptomatology or effects on the healthy human organism have also been described in great detail by Allen (27), Hering (28), Hale (29) and Houat (30).

Since *Sarracenia purpurea* has been used as a remedy for smallpox, it is of interest to note that one of the symptoms reported in Cigliano's proving (17) was: "Eruptions similar to crusta lactea; on forehead and hands papular eruptions, changing to vesicular with the depression as in smallpox, lasting from seven to eight days." On the other hand, Oehme (25), in his proving, reported: "at no time the least affection of the skin."

Sarracenia purpurea has been used with success in the homeopathic treatment of certain diseased conditions. Thus it was used by Crica (31) for phlyctenoid herpes, and by Berridge (32) for visual disorder. Cigliano (17) and Mouremans (18) used *Sarracenia purpurea* in homeopathic dosage with success, both as a prophylactic against smallpox and as a remedy in the treatment of that disease.

Use in Eclectic Medicine. King's American Dispensatory (34) is the "standard authority" of the National Eclectic Medical Association. In this Dispensatory, a monograph is devoted to "Sarracenia-Pitcher Plant. The root of *Sarracenia purpurea*." In the monograph, mention is made of the following species of *Sarracenia*, "all of which, probably, possess medicinal virtues": *S. heterophylla* (a variety of *S. purpurea*), *S. rubra*, *S. flava*, *S. variolaris* (*S. minor*), *S. Drummondii*, and *S. psittacina* (*S. psittacina*). The therapeutic actions of *Sarracenia* are described as not fully ascertained, although it is supposed to be a stimulating tonic, diuretic and laxative; mention is made of its use in chlorosis, and in various gastro-intestinal and genito-urinary disorders. Its value in smallpox is questioned. The infusion of the leaf is stated to be equally available with that of the root. The preparations described are: the powdered root, the infusion, the syrup, and the tincture. Their respective doses are stated to be: *Powdered root* 20 to 30 grains, 3 or 4 times daily; *infusion* or *syrup* 1 to 3 fluid ounces; *tincture* (8 ounces of fresh root in 1 pint of 76 per cent. alcohol) 1 to 20 drops.

Scudder (35) includes *Sarracenia purpurea* in his treatise on "Specific Medication and Specific Medicines." His description of the tincture and its dosage is the same as in the dispensatory just cited (34).

Scudder (36) discussed *Sarracenia purpurea* in his series of papers on the specific action of medicines. He expressed the opinion that, as the plant dries and ages, it loses its medical properties, its bitter, astringent taste, and its "somewhat pungent impression on the fauces." He recommended that the remedy be "prepared from the fresh root, obtained at the proper season," and directed that the tincture be prepared from the fresh root in the proportion of 8 ounces to 1 pint of 76 per cent. alcohol. The dosage of this tincture is given as 1 to 20 drops.

Smith (37) published a paper on "*Sarracenia purpurea* an Arterial Sedative and a Specific in Smallpox." He stated "that the plant is a sedative, almost equal to Aconite or Veratrum in all forms of eruptive disease, as far as I have tested it," and that it "has an additional influence in smallpox that no other remedy has." Mention has been made, in a preceding section, of his use of this remedy in the treatment of smallpox.

The major portion of the communication of Logie (16), which has been reviewed in a preceding section, was also published in the *Eclectic Medical Journal* (38).

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CONSTANTINE HERING RESEARCH LABORATORY,
Hahnemann Medical College.

ABSTRACTED AND REPRINTED ARTICLES

THE QUESTION OF DRUG STORE OWNERSHIP*

Pennsylvania Statute is Declared Unconstitutional in Decision of Supreme Court

LOUIS K. LIGGETT COMPANY, APPELLANT, v. THOMAS J. BALDRIGE,
ATTORNEY GENERAL OF THE COMMONWEALTH OF PENNSYLVANIA,
ET AL., No. 34, SUPREME COURT OF THE UNITED STATES.

IN THIS CASE THE SUPREME COURT held that a Pennsylvania statute requiring operators of pharmacies and drug stores to be licensed pharmacists was held unconstitutional as being in contravention of the due process clause of the Fourteenth Amendment.

The statute provided that every pharmacy or drug store shall be owned only by a licensed pharmacist and, in the case of corporations, associations and copartnerships, requires that all partners or members thereof shall be licensed pharmacists, with the exception that the law should not be applicable to drug stores and pharmacies already conducted by corporations, associations, and partnerships.

Dissent is Filed by Justice Holmes

Mr. Justice Holmes rendered an opinion in dissent, in which Mr. Justice Brandeis joined. It was contended therein that the legislation was within the power of the State.

The full text of the opinion of the Court, delivered by Mr. Justice Sutherland, and of the dissenting opinion follows:

This appeal brings here for consideration a challenge to the constitutionality of an act of the Pennsylvania legislature approved May 13, 1927, Pa. St. Supp. 1928, sections 9377a-1, 9377a-2.

Chain of Drug Stores Operated by Corporation

The act provides that every pharmacy or drug store shall be owned only by a licensed pharmacist, and, in the case of corporations, associations and copartnerships, requires that all the partners or mem-

*Reprinted from *The United States Daily*.

bers thereof shall be licensed pharmacists, with the exception that such corporations as are already organized and existing and duly authorized and empowered to do business in the State and own and conduct drug stores or pharmacies, and associations and partnerships, which, at the time of the passage of the act, still own and conduct drug stores or pharmacies, may continue to own and conduct the same.

The appellant is a Massachusetts corporation authorized to do business in Pennsylvania. At the time of the passage of the act, appellant was empowered to own and conduct and owned and thereafter continued to own and operate a number of pharmacies or drug stores at various places within the latter State.

After the passage of the act, appellant purchased and took possession of two additional drug stores in that State and carried on and continues and intends to continue to carry on a retail drug business therein under the title of "drug store" or "pharmacy," including the compounding, dispensing, preparation and sale at retail of drugs, medicines, etc.

The business was and is carried on through pharmacists employed by appellant and duly registered in accordance with the statutes of the State. All of the members (stockholders) of the appellant corporation are not registered pharmacists, and, in accordance with the provisions of the act, the Pennsylvania State Board of Pharmacy has refused to grant appellant a permit to carry on the business.

It further appears that the State Attorney General and the District Attorney of the proper county have threatened and intend to and will prosecute appellant for its violation of the act, the penalties for which are severe and cumulative. Suit was brought to enjoin these officers from putting into effect their threats, upon the ground that the act in question contravenes the due process and equal protection clauses of the Fourteenth Amendment.

It is clear from the pleadings and the record, and it is conceded, that if the act be unconstitutional as claimed, appellant is entitled to the relief prayed. *Terrene v. Thompson*, 263 U. S. 197, 215; *Ex Parte Young*, 209 U. S. 123.

The court below, composed of three judges, heard the case upon the pleadings, affidavits and an agreed statement of facts, and rendered a decree denying a preliminary injunction and, upon the agreed submission of the case, a final decree dismissing the bill for want of equity. 22 F. (2d) 993. The statute was held constitutional upon the ground that there was a substantial relation to the public interest

in the ownership of a drug store where prescriptions were compounded.

In support of this conclusion, the Court said that medicines must be in the store before they can be dispensed; that what is there, is dictated not by the judgment of the pharmacist but by those who have the financial control of the business; that the legislature may have thought that a corporate owner in purchasing drugs might give greater regard to price than to quality, and that if such was the thought of the legislature the Court would not undertake to say that it was without a valid connection with the public interest and so unreasonable as to render the statute invalid.

Property Rights Entitled to Protection

That appellant's business is a property right, *Duplex Co. v. Deering*, 254 U. S. 443, 465; *Truax v. Corrigan*, 257 U. S. 312, 327, and as such entitled to protection against State legislation in contravention of the Federal Constitution, is, of course, clear.

That a corporation is a "person" within the meaning of the due process and equal protection clauses of the Fourteenth Amendment, and that a foreign corporation permitted to do business in a State may not be subjected to State statutes in conflict with the Federal Constitution, is equally well settled. *Kentucky Co. v. Paramount Exch.*, 262 U. S. 544, 550; *Power Co. v. Saunders*, 274 U. S. 490, 493, 496-497; *Frost Trucking Co. v. R. R. Comm.*, 271 U. S. 583, 594 et seq.

And, unless justified as a valid exercise of the police power, the act assailed must be declared unconstitutional because the enforcement thereof will deprive appellant of its property without due process of law.

The act is sought to be sustained specifically upon the ground that it is reasonably calculated to promote the public health; and the determination we are called upon to make is whether the act has a real and substantial relation to that end or is a clear and arbitrary invasion of appellant's property rights guaranteed by the Constitution. See *Adair v. United States*, 208 U. S. 161, 173-174; *Mugler v. Kansas*, 123 U. S. 623, 661.

The police power may be exerted in the form of state legislation where otherwise the effect may be to invade rights guaranteed by the Fourteenth Amendment only when such legislation bears a real and substantial relation to the public health, safety, morals, or some other phase of the general welfare. Here the pertinent question is: What

is the effect of mere ownership of a drug store in respect of the public health?

A State undoubtedly may regulate the prescription, compounding of prescriptions, purchase and sale of medicines, by appropriate legislation to the extent reasonably necessary to protect the public health. And this the Pennsylvania legislature sought to do by various statutory provisions in force long before the enactment of the statute under review.

Briefly stated, these provisions are: No one but a licensed physician may practice medicine or prescribe remedies for sickness (Pa. St. 1290, Section 16779); no one but a registered pharmacist lawfully may have charge of a drug store (Pa. St. 1920, Sections 9323, 9327); every drug store must itself be registered, and this can only be done where the management is in charge of a registered pharmacist (Pa. St. Supp. 1928, Section 9329a-2); stringent provision is made to prevent the possession or sale of any impure drug or any below the standard, strength, quality and purity as determined by the recognized pharmacopœia of the United States (Pa. St. 1920, Section 9337; Pa. St. Supp. 1928, Section 9339); none but a registered pharmacist is permitted to compound physician's prescriptions (Pa. St. 1920, Sections 9317, 9323); and finally, the supervision of the foregoing matters and the enforcement of the laws in respect thereof are in the hands of the State Board of Pharmacy, which is given broad powers for these purposes.

It, therefore, will be seen that without violating laws, the validity of which is conceded, the owner of a drug store, whether a registered pharmacist or not, cannot purchase or dispense impure or inferior medicines; he cannot, unless he be a licensed physician, prescribe for the sick; he cannot, unless he be a registered pharmacist, have charge of a drug store or compound a prescription. Thus, it would seem, every point at which the public health is likely to be injuriously affected by the act of the owner in buying, compounding, or selling drugs and medicines is amply safeguarded.

Constitutional Right Denied by State Law

The act under review does not deal with any of the things covered by the prior statutes above enumerated. It deals in terms only with ownership. It plainly forbids the exercise of an ordinary property right and, on its face, denies what the Constitution guarantees.

A State cannot, "under the guise of protecting the public, arbi-

trarily interfere with private business or prohibit lawful occupations or impose unreasonable and unnecessary restrictions upon them." *Burns Baking Co. v. Bryan*, 264 U. S. 504, 513. See also *Meyer v. Nebraska*, 262 U. S. 390, 399-400; *Norfolk Ry. v. Public Serv. Comm.*, 255 U. S. 70, 74; *Pierce v. Society of Sisters*, 268 U. S. 510, 534-535; *Weaver v. Palmer Bros. Co.*, 270 U. S. 402, 412-415; *Fairmont Co. v. Minnesota*, 274 U. S. 1, 9-11.

In the light of the various requirements of the Pennsylvania statutes, it is made clear, if it were otherwise doubtful, that mere stock ownership in a corporation, owning and operating a drug store, can have no real or substantial relation to the public health; and that the act in question creates an unreasonable and unnecessary restriction upon private business.

No facts are presented by the record, and, so far as appears, none were presented to the legislature which enacted the statute, that properly could give rise to a different conclusion.

It is a matter of public notoriety that chain drug stores in great numbers, owned and operated by corporations, are to be found throughout the United States. They have been in operation for many years. We take judicial notice of the fact that the stock in these corporations is bought and sold upon the various stock exchanges of the country and, in the nature of things, must be held and owned to a large extent by persons who are not registered pharmacists.

If detriment to the public health thereby has resulted or is threatened, some evidence of it ought to be forthcoming. None has been produced, and, so far as we are informed, either by the record or outside of it, none exists.

The claim, that mere ownership of a drug store by one not a pharmacist bears a reasonable relation to the public health, finally rests upon conjecture, unsupported by anything of substance. This is not enough; and it becomes our duty to declare the act assailed to be unconstitutional as in contravention of the due process clause of the Fourteenth Amendment. Decree reversed.

November 19, 1928.

SECTION 1. Every pharmacy or drug store shall be owned only by a licensed pharmacist, and no corporation, association or copartnership shall own a pharmacy or drug store, unless all the partners or members thereof are licensed pharmacists; except that any corporation organized and existing under the laws of the Commonwealth or of any other State of the United States, and

authorized to do business in the Commonwealth, and empowered by its charter to own and conduct pharmacies, or drug stores, and any association or copartnership which, at the time of the passage of this act, still owns and conducts a registered pharmacy or pharmacies or a drug store or drug stores in the Commonwealth, may continue to own and conduct the same; but no other or additional pharmacies or drug stores shall be established, owned, or conducted by such corporation, association, or copartnership, unless all the members or partners thereof are registered pharmacists; but any such corporation, association, or copartnership, which shall not continue to own at least one of the pharmacies or drug stores theretofore owned by it, or ceases to be actively engaged in the conduct of a pharmacy, shall not be permitted thereafter to own a pharmacy or a drug store, unless all of its partners or members are registered pharmacists; and except that any person, not a licensed pharmacist, who, at the time of the passage of this act, owns a pharmacy or a drug store in the Commonwealth, may continue to own and conduct the same, but shall not establish or own any additional pharmacy or drug store, or if he or she ceases to operate such pharmacy or drug store, shall not thereafter own a pharmacy or drug store, unless he or she be a registered pharmacist; and except that the administrator, executor, or trustee of the estate of any deceased owner of a registered pharmacy or drug store, may continue to own and conduct such pharmacy or drug store during the period necessary for the settlement of the estate: Provided, that nothing in this section shall be construed to prevent or affect the ownership, by other than a registered pharmacist, of a store or stores wherein the sale or manufacture of drugs or medicines is limited to proprietary medicines and commonly used household drugs, provided such commonly used household drugs are offered for sale or sold in packages which have been put up ready for sale to consumers by pharmacists, manufacturing pharmacists, wholesale grocers, or wholesale druggists.

SECTION 2. Any person, copartnership, or corporation, violating the provisions of this act, shall be guilty of a misdemeanor and, upon conviction thereof, shall be sentenced to pay a fine of not more than \$100. Each day any such pharmacy is owned contrary to the provisions of this act shall be considered a separate offense.

The full text of the dissenting opinion of Mr. Justice Holmes follows:

A standing criticism of the use of corporations in business is that it causes such business to be owned by people who do not know anything about it.

Argument has not been supposed to be necessary in order to show that the divorce between the power of control and knowledge is an evil. The selling of drugs and poisons calls for knowledge in a high degree, and Pennsylvania after enacting a series of other safeguards has provided that in that matter the divorce shall not be allowed.

Of course, notwithstanding the requirement that in corporations hereafter formed all the stockholders shall be licensed pharmacists, it still would be possible for a stockholder to content himself with drawing dividends and to take no hand in the company's affairs. But obviously he would be more likely to observe the business with an intelligent eye than a casual investor who looked only to the standing of the stock in the market.

The Constitution does not make it a condition of preventive legislation that it should work a perfect cure. It is enough if the questioned act has a manifest tendency to cure or at least to make the evil less.

It has been recognized by the professions, by statutes and by decisions that a corporation offering professional services is not placed beyond legislative control by the fact that all the services in question are rendered by qualified members of the profession. See *People v. Title Guaranty & Trust Co.*, 227 N. Y. 266; *Tucker v. New York State Board of Pharmacy*, 217 N. Y. Supp. 217, 220. *Matter of Co-operative Law Co.*, 198 N. Y. 479. *People v. Merchants' Protective Corporation*, 189 Cal. 531. *New Jersey Photo Engraving Co. v. Carl Schonert & Sons*, 95 N. J. Eq. 12. *Hodgen v. Commonwealth*, 142 Ky. 722.

But for decisions to which I bow I should not think any conciliatory phrase necessary to justify what seems to me one of the incidents of legislative power. I think, however, that the police power as that term has been defined and explained clearly extends to a law like this, whatever I may think of its wisdom, and that the decree should be affirmed.

Of course, the appellant can not complain of the exception in its favor that allows it to continue to own and conduct the drug stores that it now owns. The Fourteenth Amendment does not forbid statutes and statutory changes to have a beginning and thus to discriminate between the rights of an earlier and those of a later time. *Sperry & Hutchinson Co. v. Rhodes*, 220 U. S. 502, 505.

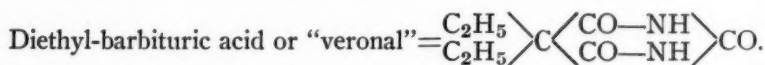
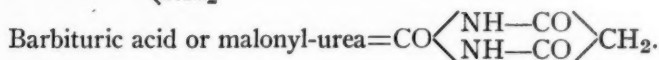
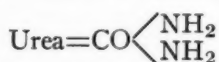
NEW REMEDIAL AGENTS

The Ureide Hypnotics*

THE INTRODUCTION INTO MEDICINE of diethyl-barbituric acid, first known as veronal¹ and now officially recognized as barbitone, was the starting point of a series of hypnotics the number of which appears to be constantly on the increase.

It has long been noted that the presence in an organic compound of an ethyl group (C_2H_5) seemed to confer on it the property of producing sleep. The simplest example is ordinary ethyl alcohol, $C_2H_5.HO$; while ethyl ether or $C_2H_5-O-C_2H_5$ is in general use as an anæsthetic. Urethane or ethyl carbamate, $CO(OC_2H_5)NH_2$, has long been in use as a hypnotic. Sulphonal, or diethyl-sulphone-dimethyl-methane, and trional, or methyl-sulphonal, are further examples of ethyl-containing hypnotics.

At the present time the hypnotics most full of promise are the derivatives of urea, and with these it would appear that the presence of an ethyl group, while frequently an advantage, is by no means essential. The members of this series are known as "ureides," and, as already mentioned, the first of these was veronal or diethyl-barbituric acid. When the residue of urea is combined with an acyl radical the resulting compound is a ureide, and when the acyl radical is from a dibasic acid the ureide is known as a cyclic ureide. The composition of a cyclic ureide is shown thus:—



Examples of simple ureides are:—

Bromo-diethyl-acetyl

urea or "adalin" = $(C_2H_5)_2CBr.CO.NH.CONH_2$.

α -Brom-isovaleryl urea $(CH_3)_2CH.CHBr.CO.NH.CONH_2$,
or "bromural."

*Reprinted from *The Prescriber*.

¹ According to Zwick, of Berne (*Med. Press*), the name "veronal" is derived from the city of Verona, where its hypnotic properties were first put to the test.

Of special importance are the cyclic ureides, of which veronal is a typical member, and it is to this group that recent additions have been most numerous. Although a powerful and useful hypnotic, veronal is not without its drawbacks, and efforts have been made, by substituting other alkyl radicals in place of one or both of the ethyl groups, to increase the hypnotic power and reduce the toxicity. "Luminal" or phenyl-ethyl-barbituric acid, "propional" or dipropyl-barbituric acid, and "dial" or diallyl-barbituric acid, are examples of such substitution, and claims of increased hypnotic effect and reduced toxicity are made for all three. Each has its own special applications; luminal, for example, has been found very useful in epilepsy, while dial is specially valuable in nervous insomnia, the dose being small and the drug rapidly broken down in the system.

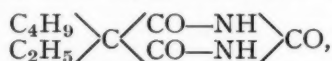
It has been observed that the hypnotic effect of these compounds bears a definite ratio to their solubility in oil. On this basis the law of "partition-coefficient" has been formulated, which is to the effect that the hypnotic action of a substance is directly proportional to the solubility in oil divided by the solubility in water. In other words, the best hypnotic is that which is most soluble in oil or fats and least soluble in water. As the cerebral cells contain a large quantity of lipid matter this postulate seems rational.

During the last few years a number of new cyclic ureides have been introduced, and while it cannot be said that all the claims for these have yet been substantiated, it is interesting to study these claims from the point of view of their chemical constitution. The following is a list of the principal cyclic ureides at present in use, with the names by which they are commonly known:—

Diethyl-barbituric acid	veronal; barbitone
Diallyl-barbituric acid	dial
Dipropyl-barbituric acid	propional
Phenyl-ethyl-barbituric acid	luminal
Butyl-ethyl-barbituric acid	soneryl; neonal
Isobutyl-allyl-barbituric acid	sandoptal
Allyl-isopropyl-barbituric acid	allonal (combination with amidopyrine)
Ethyl-isopropyl-barbituric acid	ipral (calcium salt)
Cyclohexenyl-ethyl-barbituric acid	phanodorm
Isoamyl-ethyl-barbituric acid	amytal
Isobutyl-brompropenyl-barbituric acid ..	noctal

Of these, the first four are well known, as is also allonal, which is a combination of the ureide with amidopyrine, the ureides having the property of augmenting the action of such analgesics.

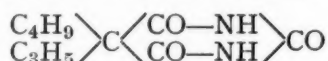
Butyl-ethyl-barbituric Acid, the formula of which is—



is veronal with a normal butyl (C_4H_9) group in place of one of the ethyl groups. In France it is known as "soneryl," and in America as "neonal." It is a white microcrystalline powder, melting at about 127°C . (260°F .), and having a slightly bitter taste. It is only very slightly soluble in water, but freely so in alcohol (1 : 5), and it dissolves in alkaline solutions forming soluble salts. The dose is from 0.05 to 0.4 gm. ($\frac{3}{4}$ to 6 grains); for mild insomnia 0.05 to 0.1 gm. ($\frac{3}{4}$ to $1\frac{1}{2}$ grain) will induce sleep, while 0.4 gm. (6 grains) is the maximum dose for twenty-four hours, administered in divided doses.

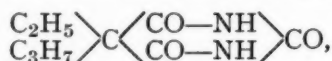
The action of butylethylbarbituric acid is the same as that of barbitone, but it is about three times more powerful. It is said to have an exceptionally strong sedative effect, and is indicated in cases of high nervous tension and neuroses in which a powerful sedative is required.

Isobutyl-allyl-barbituric Acid, the formula of which is—



has recently been introduced under the name of "sandoptal." This is supplied in tablets of 0.2 gm. (3 grains), the usual dose being one tablet. Its therapeutic index is said to be very favourable.

Ethyl-isopropyl-barbituric Acid has the formula—



and occurs as a white flocculent powder, melting at 197°C . (388.6°F .). It is slightly soluble in cold water, more soluble in hot water, and readily soluble in alkalis forming soluble salts. The compound has been examined pharmacologically by Jackson,² who concludes that

² Jackson, D. E.: Pharmacological action of isopropylethylbarbituric acid. *J. Lab. & Clin. Med.*, 1922, Oct. 23-32.

within the limits of medicinal dosage its action is confined to the central nervous system, and especially to the cerebrum. It acts on dogs as an efficient and reliable somnifacient. Clinical observations show that the dose required to produce a mild sedative effect in the average adult is 2 grains. If a deep sleep is desired and the patient is in a highly excited or delirious state, $3\frac{1}{2}$ grains may be given.

The calcium salt has been introduced under the name of "ipral." This is a white, crystalline, odourless powder, with a slightly bitter taste. It is soluble in about 40 parts of water at 25° C. (77° F.), and insoluble in alcohol. The dose is 0.12 to 0.25 gm. (2 to 4 grains), followed by a cupful of hot water or tea. It is marketed in 2-grain tablets.

Jackson and Lurie³ (Cincinnati) report clinical trials with calcium ethylisopropylbarbiturate (ipral) and confirm its selective action on the higher cerebral centres. No untoward effects upon heart, lungs, or kidneys have been noticed. The outstanding features in all cases are the ease with which a refreshing sleep is produced and the absence of lassitude or torpor next day. Even in patients with definite myocardial involvement no effect on the heart or pulse was observed. Although it is rapidly excreted, action appears to persist for twenty-four hours, as the patient usually can sleep the following night without resorting to the drug. In this way it may be used to break a habit. The drug appears to be very safe, the margin between the therapeutic and lethal doses being very great.

Cyclohexenyl-ethyl-barbituric Acid is barbitone with one of the ethyl groups replaced by a cyclohexenyl group. Its trade-name is "phanodorm," and it occurs as a white crystalline powder, having a bitter taste; it is readily soluble in alcohol (1 : 5) and in ether (1 : 10), but only very slightly soluble in cold water. The dose is 0.1 gm. ($1\frac{1}{2}$ grains) for mild simple insomnia; in obstinate insomnia 0.2 to 0.4 gm. (3 to 6 grains) may be given, but the larger dose should not be repeated within less than twelve hours. It is supplied in tablets of 3 grains (0.2 gm.). Its action is that of barbitone, but it is more than twice as toxic and the dose is correspondingly smaller. It is eliminated more rapidly than barbitone, hence its action is not so lasting. It is used for its sedative action in nervous insomnia, neurasthenia,

³ Jackson, D. E., and Lurie, L. A.: Experimental and clinical observations on the actions and therapeutic uses of ethylisopropylbarbituric acid. *J. Lab. & Clin. Med.*, 1925, Nov., 116-122.

and psychoses. Müller⁴ (Münich) reports that its action is rapid and that the patient is quite fresh next day.

Isobutyl-brompropenyl-barbituric Acid is being used to some extent on the Continent under the name of "noctal." The average dose is 0.2 gm. (3 grains), administered in hot liquid. Burghart and Schoenfeldt⁵ report favourably on its use as a hypnotic and sedative.

A combination of noctal with amidopyrine (in the proportion of 1 to 3) has been introduced as an analgesic under the name of "dormalgin." Lebermann⁶ (Würzburg) reports on its use, saying it is free from side-effects, is not cumulative, and can be given by mouth, subcutaneously, intramuscularly, intravenously, or as suppositories.

An elaborate investigation of a number of synthetic hypnotics has been made by Eddy,⁷ of Cornell University Medical College, with results of some therapeutic interest. The hypnotics examined included amongst others diethylbarbituric acid (barbitone), isoamyl-ethyl-barbituric acid (amytal), and cyclohexenyl-ethylbarbituric acid (phanodorm). Equal fractions, varying from 20 to 60 per cent. of the average fatal dose, were given to cats, and the effects were compared as regards posture, sleep, heart rate, respiration rate, analgesia, etc. over eleven thousand separate observations being recorded. None of the compounds proved to be more actively hypnotic in relation to its toxicity than barbitone, and none appeared to be relatively less toxic. None exerted analgesic effects with less than 30 per cent. of the average fatal dose; in some cases large doses actually increased the sensitivity to pain. None of the hypnotics examined produced in therapeutic doses any uniform change in the heart rate or respiratory rate. Barbitone, two hours after a dose representing 20 per cent. of the fatal dose, increased the heart rate by only five beats a minute; amytal in corresponding dose slowed the heart by an average of forty beats; with phanodorm the average rate was unchanged, though it was increased in one case and decreased in another. The hypnotic effect,

⁴ Müller, P.: Zur Behandlung von Schlafstörungen mit Phanodorm. *Münch. med. Woch.*, 1925, Aug. 28, 1463-1464.

⁵ Burghart, H., and Schoenfeldt, K.: Ueber ein neues Schlafmittel (Noctal). *Münch. med. Woch.*, 1924, Oct. 25, 1508.

⁶ Lebermann, F.: Ueber die Wirkungsweise des Dormalgin. *Münch. med. Woch.*, 1927, May 6, 768-769.

⁷ Eddy, N. B.: Studies on hypnotics of the barbituric acid series. *J. Pharmacol. & Exper. Therap.*, 1928, May, 43 (quoted in *J. A. M. A.*, 1928, Aug. 11, 398).

in doses representing 30 per cent. of the fatal dose, was practically the same for barbitone and amytal, and slightly greater for phanodorm. That means a slightly greater margin between the therapeutic and the lethal dose in the case of phanodorm.

It will be noted, of course, that the effects here recorded are relative to the respective doses of the drugs studied. In the production of new synthetic hypnotics the effort appears to be to increase the margin between the therapeutic and the lethal dose, which at present is much too narrow, and in some cases this has already been effected, though so far only to a limited extent.

PHARMACY AS A CAREER*

By R. R. Bennett

Chairman, British Pharmaceutical Conference

ON A SIMILAR OCCASION to this a well-known teacher addressing a gathering of students entering their professional career likened them to men about to march into a vast and unknown country. Older men resemble more the observer in an aeroplane, who can see tracks through the dense forests, fords across the deep rivers, and gaps in the sheer ranges, invisible to the explorers on the ground. From a height the main routes seem clear enough, though whether the observer returned to earth again could find them is another matter. To enable us to fight the battle of life we possess a host of cells situated in the brain, and it is on the measure of the efficiency of these cells, and the degree of determination with which they are put into action, that success depends. The number of these brain cells in different individuals probably varies but little, so that the results attained depend largely upon the number of the cells which are trained and put into active service, and above all on the force of the initiative that keeps them at work.

SYSTEMATIC STUDY

Dean Inge has said that education is not the stuffing of a receptacle with lumps of knowledge; it is the training and development of the faculties, and a teacher must therefore look forward to the time when his pupils begin

*Delivered at the Inauguration Exercises, School of Pharmacy, London, England. Reprinted from *Chemist and Druggist*.

to educate themselves. It is often stated that what is got for nothing is seldom worth having. What is true of material things holds good for those of the mind. Knowledge lightly gained is not as a rule firmly held. The alpha and omega of all study is system, not the rigid system that is a mere mechanism, but a system that is constrained to disciplined labor. There should be regular hours of study, few or many, but never so many as to exhaust mind and body, since effective progress cannot be made if either the brain or the body is fatigued. An hour a day devoted intensively and profitably to the study of a subject will ensure mastery of it in what may seem an incredibly short time.

If real progress is to be made, it is a "condition precedent" that the student should not pass on to an advanced stage of the subject until he has fully comprehended and assimilated the elementary parts. Too often this precaution is ignored, and in consequence whilst there is apparent progress, the student ultimately finds himself in the plight of one who would seek to learn to read without first knowing the alphabet. There is no model or plan of study that is of universal applicability. There must be a system if study is to be progressive, but whereas there are general conditions, common to all the extant systems, the adaptive modification of the system must needs be governed by the circumstances or even by the idiosyncrasies of the individual.

It was said by Bacon that reading maketh a full man, conference a ready man, and writing an exact man. It is not merely that writing about a subject improves the memory of it, still more it improves the clearness of the subject in the mind. Writers of monographs and textbooks not infrequently acknowledge that the persons to whom the writing has been most beneficial are the authors themselves. Lord Kelvin is reported to have said that he did not feel he had fully understood anything until he had made a working model of it. Most of us cannot hope to make working models, but to be able to write a coherent and lucid description of anything is a great advance on merely having memorized some textbook account. Too much reading may induce mental dyspepsia, it may breed excessive obedience and so destroy originality and independent thought. Obviously the student should read, but let it be methodical and accompanied by critical analysis and digestion, so that the state of the Strasbourg goose be not the result. As a practical working method, a written abstract of a chapter serves a double purpose, not only does it impress details

on the mind much more effectively than mechanically underlining the book, but it is more useful for future reference.

It is a common mistake to measure the amount of work by the clock: the real criterion is not the number of hours spent, but the degree of concentration brought to bear on the subject. It is concentration that produces the greatest effect in the minimum of time, and it is the economical secret of the successful and busy man. Attention to the task in hand is disturbed more often by preoccupation with other interests than by any other cause. "Single-mindedness" is essential for efficient work of any kind. Interest is of vast importance—we remember best what interests us most. Interest in the thing to be done is the driving force that puts the intellect into action. The acquirement of knowledge centres very largely round this point, and where the interest of the student is maintained the mastery of a subject—whatever it may be—presents no very real difficulty.

**THE CHOICE OF
A PROFESSION**

The choice of a profession is a matter of no small moment. To follow the wrong profession is a tragedy, and a sure bid for unhappiness and failure. Bacon says: "They are happy men whose natures sort with their vocations." Carlyle goes further in the same direction when he says: "Blessed is the man who has found his work; let him seek no other blessedness." The very first essential of success is love of the subject you are making your life's work. It must not be merely a means of earning a livelihood, but it should be the only means for you. If each one of you can truthfully say, "I would prefer to live modestly as a pharmacist than seek more lucrative employment in another career," then you have made the right choice, and the first element of success is there. The love of one's vocation is necessary in the first place, because no man puts his best into distasteful work. Secondly, pharmacy—in common with other professions—makes heavy demands upon its followers, and no man will do the amount of strenuous work necessary to ensure success unless he really enjoys it.

In pharmacy, as in other callings, there is always scope for the best men. Broadly speaking, success is achieved by competence, capability and individuality. Competence is based on a sound general education, systematic technical training, and close acquaintance with modern practice. Capability is the skill to apply knowledge and experience; while individuality comprises truthworthiness, tact, energy, enthusiasm, foresight, and general force of character. The result lies almost entirely with the individual. No one can expect to command

success without merit, patience, and persistent hard work. Those who are devoid of enterprise do not usually make leaders of men, nor do they contribute to the advance of industries, or to the progress of nations. The success of every profession depends mainly upon the individual efforts of its members. The aim of the individual, therefore, should be to acquire knowledge, skill and experience of the highest order, so that he may render himself available for suitable opportunities as they arise, and be ready and willing to venture when the time comes. Men are built to work, and are happiest when they are working. They are given powers of will and brain to use, and they are happiest when they are using them. Our minds need the frame of some practical purpose if they are to be at their best.

EFFICIENCY

The law imposes a certain minimum of efficiency as represented by the Qualifying examination. While this should be regarded as the irreducible minimum, it is unfortunately sometimes looked upon as the maximum either to be evaded altogether or to be completed with the minimum of trouble. I say emphatically that the Qualifying examination should be taken as the foundation on which to build a superstructure of greater knowledge. The ill-educated pharmacist, the man who is out of touch with recent improvements in the art of his business, who is incompetent to undertake any work which lies at all outside his most ordinary routine, today is an anachronism.

Efficiency in the science and art of pharmacy is two-fold, technical and general. Technical efficiency may be acquired by study, investigation, and practice, while general efficiency will be attained by the cultivation of character and personality. No man can know too much about his own vocation, and for this reason the pharmacist ought to take every opportunity to add to his store of knowledge. He should keep abreast of pharmaceutical literature, and he should keep himself informed as to the trend of modern medicine. He should keep his technical library up to date so as to be ready for every emergency, and he should experiment with the object of producing preparations which please the eye and palate. It is true that this last can be done for him, but that, again is not efficiency, it is relapse to the irreducible minimum. All sciences are progressive, and the pharmacist must endeavor to keep pace with the progress of his profession. He must be familiar with the latest applications, and he must have regard to its possible developments in the future. He cannot afford to neglect opportunities of extending his knowledge and gain-

ing experience, and he will find it advisable to keep in touch with his professional brethren in order to maintain broad views. In addition, he should associate with those who follow lines of thought outside his particular interests.

RESPONSIBILITY There must exist among pharmacists a sense of mutual responsibility in their relations to one another and to the community. It is essential that everyone preparing for a professional career should know something of his obligations as well as the measure of his privileges. These privileges affect his ideas of loyalty and discipline. Viewed in the light of service to the community, a pharmacist's chief duty is obviously to make himself as efficient as possible. All who are concerned with the advancement of professional interests recognize that it is essential not only to maintain a high standard of conduct, and to create a fellowship conforming to recognized ethics. Every pharmacist should realize his position as a member of a profession, and endeavor to conform to its standards. His education and technical training give him a definite status and warrant him in supporting the profession. The adoption of a low standard is a fundamental error which is difficult to rectify, and is injurious to the profession generally. Marcus Aurelius said: "That which is not for the whole swarm is not for the interest of a single bee." Any departure from the accepted code renders the offender liable to have his conduct inquired into with the possibility of reprimand or suspension or expulsion from the society of which he is a member, while the ill-considered action of any individual member may affect adversely the profession as a whole in the estimation of the public. It should be a matter of personal concern for everyone to assist in maintaining the reputation of his calling by refraining from any doubtful course of action. The progress of any profession will always depend upon the character and ability of the men who devote their life to it. It is perhaps true that in this country pharmacy has not yet acquired the material recognition which is its due. It is only by united effort in educating public opinion that its claims will be brought home to the uninitiated. In aiming at the enhancement of status there is a constant demand for improvement in matters educational, technical, and ethical. It is not reasonable to suppose that these matters can ever be definitely established for all time, or to the satisfaction of everybody; but under the influence of these movements there is a general tendency towards higher standards and higher ideals.

**POST-GRADUATE
STUDY**

The advancement of every science depends upon the encouragement of research. The demands of the business side of pharmacy are today so imperative that there is a danger of neglecting what is of primary importance. The course that pharmacists should pursue, in order that the present condition of things may be improved, and the outlook of the future made more bright, is to cultivate assiduously the scientific side of pharmacy—in the promotion, encouragement, and assistance of pharmaceutical research, in the improvement of pharmaceutical products, and in keeping pharmacy abreast of advances in chemotherapy, biochemistry, pharmacology, and other kindred subjects. Only by giving first place to the professional side of pharmacy will it be possible to maintain and to enhance the esteem in which pharmacists are held by their fellow men. In this building many schemes have been discussed for the post-graduate training of pharmaceutical students. The opportunity for such work may not be within the reach of all, but the Pharmaceutical Society has made provision for research in pharmacognosy, chemistry, and pharmacology, and this has resulted in notable additions to our knowledge in these branches of science.

In my address at this year's annual meeting of the British Pharmaceutical Conference I referred to the change which has been taking place during recent years, and is still in progress, in the whole outlook and orientation of therapeutic practice, and the inevitable repercussion of this change in therapeutics on its principal ally—pharmacy. The latest advances in biochemical knowledge have given additional prominence to the work now carried out in the Society's pharmacological laboratories, and the steadily increasing demand for the services of these laboratories may be taken as symptomatic of the definite beginning of a new era in pharmacy. Everything points to an increasing demand for pharmacological workers in this country, and all who realize this must welcome the action of the Pharmaceutical Society in the institution of their new laboratories.

I am convinced that as soon as you are free from the trammels of examinations, it would be greatly to your advantage to devote some of your time to original investigation. Given a well-chosen subject, there is nothing to equal the fascination of original work. Use your eyes all the time, let nothing escape you, and especially observe the unexpected results. Never assume that books must be right and you must be wrong if you get an unforeseen result. You may be on the verge of an important observation. The future of pharmacy de-

pends upon its younger generation. I beg you to equip yourselves for this grave responsibility by cultivating the scientific habit of mind, so that you will be able to confront new conditions and new difficulties with wide and systematic knowledge.

CONCLUSION

In coming to this Society's School of Pharmacy you have arrived at an institution rich in tradition. The School is pervaded by an atmosphere into which I hope you will fully enter. It is a blending of tradition and freedom, of ancient usages and new methods, where the intellect is trained and the character is moulded. It is not merely a school of learning, but a school of life and conduct and a source of life-long inspiration. In this school you are new students, you have come from all parts of Britain, you are anxious to learn, anxious to understand. You will join hands and become keen and determined fellow workers in the field of pharmacy. You have been admitted as junior members of a circle of leaders in pharmacy, a privilege carrying with it a correspondingly high obligation. The influence of the school cannot easily be overestimated, for it is one of the most valuable gifts which our Alma Mater confers upon successive generations of her sons and daughters. It is for you all to make the fullest and the best use of the opportunities which you will all enjoy.

DEBUNKING HEALTH EDUCATION*

By Iago Galdston, M. D.

Secretary, Health Education Service, New York Tuberculosis and Health Association, New York

DEBUNKING IS ONE of the newer words of mongrel origin whose expressiveness promises to win it admission to the family of respectable terminology. It is used herein minus one of its connotations, that of malicious intent to deceive.

Close scrutiny of the current health education material produced by voluntary health agencies, insurance companies and commercial organizations discloses much superficiality of thought, many broad and unwarranted deductions from slim premises, exaggerated emphasis and outright falsehoods; in other words, there is evident a good deal of "bunk" in health education.

*Reprinted from the *Journal of the American Medical Association*.

That most of this "bunk" in health education material is due to excess enthusiasm untempered by adequate knowledge and experience seems like a warranted conclusion. Still no matter how pardonable its genesis, its effects cannot but prove undesirable, and its early elimination must be considered an objective to be worked for intensely.

The situation could be remedied over night through a closer affiliation between organized medicine and the private health agencies. In certain isolated communities this has been achieved with salutary effects. In the main, however, the practicing physician and his organized group still play only a minor rôle in the affairs of private public health organizations.

The writing and preparation of popular health material is an art not easily acquired; but, like most arts, though beyond minute definition, it has a body of guiding principle, adherence to which will usually produce acceptable results.

Thus in the preparation of health education material, be it in the form of literature, posters or the cinema, certainly first consideration must be given the scientific validity of the contents.

Is it so? Is it true? Is the contention, thesis, claim or propounded facts of the leaflet, speech or motion picture correct in fact, in detail and in implication? Not Is it clever? Is it startling? Is it novel? should be the first consideration, but Is it true? Is it correct? Is it honest?

Certainly, cleverness and novelty, up to a certain degree, are desirable qualities, but truth and exactness should under no circumstances be sacrificed to "the publicity urge." And truth and exactness are required not only in the facts but also in all their implications.

"Four out of five" is certainly a startling statement, and one well calculated to promote the sale of a certain dentifrice; but unfortunately or, rather, fortunately, it isn't true; it isn't correct.

Equally misleading, for example, though more in implication than in fact, is the statement recently made by a prominent dentist to the effect that a single tooth cavity can serve as residence for fourteen billion germs. There were no qualifications to this statement as to type or kind of germ, what gross harm they did, and so on. The deductions, though not indicated, seemed vaguely evident—and horrific.

The physical ills said to result from eating meat one or more times daily, drinking tea or coffee, indulging in ice water, alcohol

or tobacco are outstanding instances of health education content "that isn't so," either in absolute fact or in degree. Yet they loom large in the total number of health propaganda efforts.

At once there suggests itself to this argument an objection of seeming formidable strength. Relatively, it is argued, there is little in medicine or public health of which we are absolutely certain. If, then, we are obliged to limit the content of health education to only those facts which are demonstrable to the last degree of certainty, then the sphere of activity must shrink appreciably.

What of this objection? Formidable as it appears, it is really ill founded. The contention is not that nothing must be taught save that which is proved beyond doubt. It is merely required that, if a fact is stated as an established truth, it should be so; and if that fact is merely an hypothesis, a theory, a belief, a conjecture, it should be so qualified.

The history of medicine and public health is rich in instances wherein great gains were made in the conservation of health and in the prevention of deaths through practices based on well formulated hypotheses, on theories founded in observation and empiricism rather than on precise and clearly understood scientific facts.

On the other hand, enthusiasms and excess zeal often lead into grave errors. Superlatives are used where only relatives are permissible. The faith and trust of the lay public are thus violated and, if the public cannot trust our health education for truth and exactness, what can it trust?

What goes into health education should first of all pass through the critical test of correctness and exactness.

Is it so? Is the fact presented a fact, or is it not so? Should it be qualified by a "maybe" or "perhaps" or "we believe"? Are all the implications sound?

When it is as reasonably certain as possible that the contents are sound, the contentions warranted and the counsel correct, there is a second test to apply to the contents of health education material, and this second test asks "Is it pertinent?"

Not all that is true is pertinent, yet it is pertinence that lends significance to and often makes the truth forceful and appealing. There is a hierarchy in the sphere of health education that sets certain of its items above the others, that stamps certain items as of first importance and others as of lesser importance. Thus, frequent bathing is a desirable health habit, but adequate rest is an essential one.

Perhaps the overindulgence in ice water may or may not be mildly deleterious to good health. It is certainly, however, an item of small importance and one with which we can ill afford to deal until the other and more important public health problems have been tackled.

The indiscriminate and uncritical lumping together of the various items in health education, some of major and others of minor importance, tends to reduce the whole mass to its lowest, rather than to its highest, denominator. The significant point is paled by the trivial. The urgent counsel is lost in the mass of general advice which the man in the street can pass by unheeding, without substantial loss.

That which is of first importance should be accorded first place in health education, and that which is third in importance should not crowd the first.

When, therefore, the content of the health education material has been tested for exactness and truth, it should be tried for pertinence. And before it is accepted, the question should be asked: Is this material significant, is it vital, is it relatively important, in a word, is it pertinent and fitting for the age, sex, racial and economic group for which it is aimed?

And now, having tested the health education material for truthfulness and pertinence, it must further prove on the score of psychologic soundness.

There is an art in the manner of "saying" that often glorifies that which might otherwise be damned. This art is conspicuously absent in much of current health education material.

The correct psychologic approach is the touchstone of all human relationships and is of uncommon importance in health education. For, to a large extent, the objective of health education is the conversion of mankind to a view and a manner of life that are in many respects different from those commonly practiced.

Many centuries of experience have impressed us with the fact that, to achieve desired ends in the modification of human conduct, the logic that pleads for the change in conduct must be cloaked in an appropriate emotional appeal.

What goes into health education, therefore, should be correct, pertinent and psychologically sound.

MEDICAL AND PHARMACEUTICAL NOTES

THE SULPHOCYANATES IN MEDICINE—Anything that confesses to a frank relationship with the cyanides conjures an immediate vision of that nightmare of the handler of medicines—the dread POISON. The cyanides are so poisonous, according to one schoolboy, that a grain placed on the tongue of a dog is enough to kill a man. No wonder, then, that the recent vogue of prescribing the sulphocyanates has been regarded with alarm by many a dispenser.

Potassium and sodium sulphocyanate, and in a few cases the ammonium salt, have come into recent use in the treatment of high blood pressure.

Dr. Leslie T. Gager is the author of a study entitled "The Incidence and Management of Hypertension, with a Note on Sulphocyanate Therapy," which appeared in the *Journal of the American Medical Association*, Vol. 90, No. 2, Jan. 14, 1928. Sulphocyanate medication had been previously tried by various investigators but the large doses given had produced unsatisfactory side-effects and the drug had fallen into disrepute. But with the careful work of Dr. Gager the chemical is again exhibited in the prescriptions of physicians all over the country and in the past few weeks many the pharmacist who has hesitated, because of a glaring poison label on the sulphocyanate bottle, to dispense the medicament. Pharmacists will do well to note the following points:

The sulphocyanates are also called thiocyanates and rhodanates, and should be dispensed, when called for, only when assurance is had of their chemical purity—and freedom from cyanides.

The dosage varies some, and while that is obviously the concern of the prescriber, it is in the interest of safety that the dispenser, too, is conversant with the range of the dose.

The average dose varies from 0.1 gm. ($1\frac{1}{2}$ grains) to 0.3 gm. ($4\frac{1}{2}$ grains), given in aqueous solution three or four times daily. Most authorities look askance at anything over the $1\frac{1}{2}$ -grain dose, since there is a danger of toxic symptoms arising from retention of the sulphocyanate, this, of course, being more probable in cases of hypertension with severe kidney complications.

A STRANGE SYMBOL—A prescription of foreign origin puzzled the dispenser because of a strange symbol it contained. The original is not available but it was of the following type:

Sol. supraren. chlor. 1 ⁰⁰ / ⁰⁰	10 gm.
Acid borici	2 gm.
Aq. dest. ad.	100 gm.

Because of the nature of the final ingredient, the symbol, which is largely used on the continent, is identified as 1 pro mille or 1 per 1000.

STERILIZATION OF DRINKING WATER—Developed by the United States Army Medical Corps, succinchlorimide is prepared in tablets, one of which, dropped in bacteria-infested water, promptly and permanently terminates the malicious career of the disease carriers.

Succinchlorimide is expected to prove a great boon to soldiers in the field, campers, tourists, and others who often find themselves in the open country without any effective means of sterilizing water, said Major C. B. Wood, of the United States Army Medical School, who discussed the new disinfectant before the Institute of Chemistry recently. Major Wood expects the substance to be officially adopted by the Army and Navy Departments.

"By working with a derivative of succinic acid containing active chlorine, we hit upon this new succinchlorimide," says Major Wood. "A tablet or two of this will kill all disease-producing germs in a canteen of water. The taste is barely changed. The compound does not—as far as we know—deteriorate, this giving it a decided advantage over bleaching powder, which was formerly used for the purpose."—(*Scientific American*, Nov. 1928, p. 452.)

SOIL CHEMISTS URGED TO STUDY IMPORTANCE OF LESS COMMON ELEMENTS—Dr. Oswald Schreiner, president of the Association of Official Chemists, whose members from all parts of the United States are in session here, stated today in the annual meeting at the Hotel Raleigh that the association has rendered a signal service to the welfare of this country and the world.

He told the men who guard the food and fertilizer and drugs of the various States of the Union that there is new and important work to be done in discovering the part played by the less common

elements, both in industrial processes and in the life of animals and plants. He called attention to the fact that large areas of soil are notably lacking in some of these rarer though essential elements, deficiencies of which are harmful to the growing crops in a manner which has hitherto been little understood.

Pointing specifically to nutrition studies with citrus trees, Doctor Schreiner, who is chief of the division of soil fertility in the Bureau of Chemistry and Soils, United States Department of Agriculture, states that the absolute necessity for these rarer elements has been proved in many places. Recent experiments by the Department of Agriculture have shown that applications of manganese, a fertilizing element little regarded until recently, have made all the difference between success and failure in the cultivation of tomatoes on large areas of Florida lands, and other experiments in the Florida Everglades have lately proved that plant growth has been enormously stimulated and benefited by the use of small quantities of copper as a fertilizer.

These facts open a new and important field of research and one in which the most refined methods and measurements will be required, Doctor Schreiner said.

BAUMÉ GRAVITY—The formula now recommended by the Bureau of Standards and accepted by the petroleum trade generally for converting Baumé degrees to specific gravity is

$$\text{Sp. Gr.} = \frac{141.5}{131.5 + \text{deg. Bé}}$$

Existing tables are based, as a rule, on the old formula, but the error is slight.—(*Power*, p. 757.)

DEPARTMENT OF AGRICULTURE ANNOUNCES STANDARDS FOR GINGER ALE, SARSAPARILLA AND CINNAMON EXTRACTS—Revised and amended definitions and standards for ginger ale and ginger ale flavor, sarsaparilla and sarsaparilla flavor, and for cinnamon extracts have been adopted by the Secretary of Agriculture at the recommendation of the Food Standards Committee, according to an announcement by the Food, Drug and Insecticide Administration of the United States Department of Agriculture. These definitions and standards are adopted for the guidance of officials of the department in the enforcement of the Federal Food and Drugs Act.

The Food Standards Committee is a joint committee composed of three representatives each of the Association of Dairy, Food and Drug Officials of the United States, the Association of Official Agricultural Chemists and the United States Department of Agriculture.

The text of the revised and amended definitions and standards is as follows:

Ginger Ale is the carbonated beverage prepared from ginger ale flavor, sugar (sucrose) sirup, harmless organic acid, potable water, and with or without caramel color.

Ginger Ale Flavor, Ginger Ale Concentrate, is the beverage flavor in which ginger is the essential constituent, with or without aromatic and pungent ingredients, citrus oils, fruit juices, and caramel color.

Sarsaparilla is the carbonated beverage prepared with potable water, sugar (sucrose) sirup, sarsaparilla flavor, and with or without caramel color. It may or may not be acidulated.

Sarsaparilla Flavor is the beverage flavor prepared from oil of sassafras and methyl salicylate (or oil of wintergreen, or oil of sweet birch) with or without other aromatic and flavoring substances, and caramel color. It derives its characteristic flavor from oil of sassafras and methyl salicylate.

Cinnamon Extract, Cassia Extract, Cassia Cinnamon Extract, is the flavoring product prepared from oil of cinnamon, and contains not less than 2 per cent. by volume of oil of cinnamon.

Oil of Cinnamon, Oil of Cassia, Oil of Cassia Cinnamon, is the lead-free volatile oil obtained from the leaves or bark of *Cinnamomum cassia* (L.) Blume, and contains not less than 80 per cent. by volume of cinnamic aldehyde.

Ceylon Cinnamon Extract is the flavoring extract prepared from oil of Ceylon cinnamon and contains not less than 2 per cent. by volume of oil of Ceylon cinnamon.

Oil of Ceylon Cinnamon is the lead-free volatile oil obtained from the bark of the Ceylon cinnamon (*Cinnamomum zeylanicum* Nees), and contains not less than 65 per cent. by volume of cinnamic aldehyde and not more than 10 per cent. by volume of eugenol.

NEWS ITEMS AND PERSONAL NOTES

A NEW MAPLE FLAVOR—Fritzsche Brothers, Inc., have just announced a real flavor novelty which will be found of outstanding interest to every user of flavoring materials. This consists of a genuine concentrated True Maple Flavor more than sixty times the strength of the finest maple syrup and the price is such that in addition to the convenience and economy of transportation, storage and use, it actually costs much less than does the use of either maple syrup or maple sugar.

It is believed that this is the first time that such a flavor has been offered commercially. The process whereby it is produced was developed from a laboratory method worked out by Doctors Sale and Wilson of the U. S. Department of Agriculture and which was the subject of a patent about a year ago. More than a year's intensive experimenting was required to transform this method to a workable commercial process.

The flavor is readily soluble in water, syrup and glycerine and this property, coupled with its high degree of concentration, will open up many fields hitherto closed to this particular flavor.

The convenience of such a flavor for the confectioner, ice cream manufacturer and other producers of food products will be readily apparent and it is reported, furthermore, that by the addition of this flavor to normal sugar syrup a reconstituted syrup in nowise inferior to the original maple syrup may be prepared and at a great saving in cost.

DR. FREDERICK G. GERMUTH ASSUMES NEW DUTIES—Dr. Frederick G. Germuth, now associated with the Bureau of Standards, Department of Public Works, and the Public Improvement Commission of Baltimore City, in the capacity of analytical and research chemist, has accepted the position of research chemist with McCormick & Company, Inc., at their Baltimore laboratories.

Dr. Germuth will assume his duties, which will consist of researches in the field of drugs, flavoring extracts, pharmaceuticals and spices, on January 2, 1929.

Dr. Germuth, who has carried out numerous research programs as head of the Division of Research, is the author of many papers, a number of which have appeared in the columns of this Journal.

MULFORD COMPANY ESTABLISHES ENGLISH HOUSE—Rapid growth in their export business has made it imperative for the H. K. Mulford Company to establish headquarters in London in order to facilitate the development of business in Great Britain as well as the British colonies. The English company will be known as H. K. Mulford Company, Ltd., with offices centrally located in the medical section of the West End at 252 Regent Street, within a stone's throw of Oxford Circus.

The organization of the British company was carried out under the direction of Mr. A. E. Wills, who represented the Mulford Company in England from 1914 to 1917, and who is now Eastern divisional salesmanager of the company.

Mr. T. W. Rayner will be the managing director of the English company, and representatives will cover London, northern and southern Ireland, Scotland, and the northern part of England to work with the distributors established in these sections.

PHILADELPHIA DRUG EXCHANGE COMMENDS PHILADELPHIA PROHIBITION OFFICE—At the "get-together" luncheon of the Philadelphia Drug Exchange held Wednesday November 14, noon, at the Ledger Club, Col. Samuel O. Wynne, Prohibition Administrator for the Philadelphia District, was the speaker, followed by Messrs. Hunsberger and Macphee after which the following resolutions were unanimously adopted: "The Philadelphia Drug Exchange conveys its thanks to Col. S. O. Wynne, Prohibition Administrator of the Fifth District, for his forceful and instructive address, and expresses its continued confidence in the efficient and businesslike administration of the Philadelphia Prohibition office as carried on by Colonel Wynne and his assistants, Messrs. Ambrose Hunsberger and Alexander P. Macphee."

BOOK REVIEWS

SOLUBILITIES OF INORGANIC AND ORGANIC COMPOUNDS, a Compilation of Quantitative Solubility Data from the Periodical Literature. By Atherton Seidell, Ph. D., Hygienic Laboratory, U. S. Public Health Service, Washington, D. C. Supplement to the Second Edition, containing data published during the years 1917-1926, inclusive. Price, \$8.00 Net. D. Van Nostrand Company, Inc., 8 Warren Street, New York.

In the preface the author discusses advantages and disadvantages of a supplement to the second edition as compared with those of a revision, and comes to the conclusion that "the disadvantages of having to search in two volumes for a particular result was not sufficient to warrant the very considerable extra cost required for printing a completely revised third edition of the book." He further says: "In order to diminish the inconvenience of having the data in a principal volume and a supplement, a subject index common to both has been provided at the end of the latter." The subject matter covers 500 pages; the author index covers 18½ pages; the subject index covers 39½ pages in double column. The information given was compiled from a list of fifty periodicals, both native and foreign. The nature of the data is such as to make it impracticable to attempt to review it as one might the subject matter in most books. Much of the data is arranged in tabular form and makes easily available a wealth of information about many things.

Those persons who are familiar with the second edition will welcome the appearance of this supplement, and those who are not cannot do better than acquire copies of both volumes—if they have need of a veritable mine of valuable information concerning many substances.

F. P. S.

A TREATISE ON PHARMACEUTICAL CHEMISTRY, Embracing Certain Special Topics of Analytical Chemistry and Physical Chemistry as They Are Related to Pharmacy. By John C. Krantz, Jr., Ph. D., Director of Pharmaceutical Research, Sharp and Dohme; Former Professor of Pharmacy in the University of Maryland. Price \$3.50. The C. V. Mosby Company, 3523-25 Page Boulevard, St. Louis, Mo.

Here is a book of apparently 282 pages, but which on examination is found to contain 17½ pages devoted to indexes and tables of

contents, 4 to portraits, 5 to title page, preface, dedication, copyright notice, etc.; 5 pages are blank; the remaining 252½ contain the subject matter.

The text is divided into three parts. Part I, Quantitative Chemistry, contains 14 chapters on The Place of Quantitative Analysis; The Gravimetric Determination of the Chlorine Ion; Theoretical Considerations of Precipitation; The Quantitative Determination of the Sulphate Ion; The Determinations of Magnesium, Phosphorus, Calcium, Aluminum, Iron, Zinc, Mercury, Copper, Bismuth, Lead; Electrolytic Determinations; The Electrolytic Determinations of the Pharmacopoeia. Part II, Organic Chemistry, in 5 chapters, considers Hypnotics, The Local Anesthetics, The Antipyretics, Bactericides, The Endocrines. Part III, Physical Chemistry, in four chapters, considers Ionization, Use of Indicators and Buffer Solutions, Equilibria, Colloidal Substances.

At the end of each chapter are given "Topics for Study" and, in many cases, "References" to literature on the matter discussed therein, one chapter having 43 such references.

Forty-three experiments are described and the chemistry or physics, or both, involved, are discussed. Structural chemical formulas are freely used in the discussion of organic compounds, and mathematical formulas are not neglected in the discussion of physical phenomena.

The author's language is clear and concise. Were this not the case he could not have covered so adequately the facts he presents in so few pages. The very nature of the ground covered by the book would seem to make it necessary for the student who would profit much from its use to have a very good foundation in theoretical general chemistry and a knowledge of mathematics greater than is possessed by the average pharmacy student. The reviewer feels that the worker who comprehends thoroughly all that is within the pages of this volume is equipped to handle almost any pharmaceutical chemistry problem that may come his way.

The mechanical features of the book—paper, binding, type, style, etc.—leave nothing to be desired.

F. P. S.